CLAIMS

1. Endogenous nucleic acid fragment of the retroviral type, in isolated form, said fragment being characterized in that it comprises or consists of at least one portion of the *gag* gene of an endogenous retrovirus associated with an autoimmune disease, or with unsuccessful pregnancy or pathological conditions of pregnancy, said portion at least encoding, directly or indirectly, an expression product, or the sequence complementary to said fragment.

2. Fragment according to claim 1, characterized in that it comprises, or consists of, said whole *gag* gene.

3. Fragment according to claim 1, characterized in that the portion at least encodes the matrix and the capsid.

4. Fragment according to claim 1, characterized in that it comprises SEQ ID NO. 1, SEQ ID NO. 2, SEQ ID NO. 3 or the sequence complementary to any one of said sequences.

5. Fragment according to claim 1, characterized in that it consists of SEQ ID NO. 1, SEQ ID NO. 2, SEQ ID NO. 3 or the sequence complementary to any one of said sequences.

6. Fragment according to claim 1, characterized in that it is located on at least one of human chromosomes 1, 3, 6, 7 and 16.

7. Fragment according to claim 6, characterized in that it is located on at least chromosome 3.

8. Fragment according to claim 1, characterized in that the expression product is messenger RNA.

9. Fragment according to claim 1, characterized in that the expression product is immunologically recognized by antibodies present in a biological sample from a patient suffering from an autoimmune disease.

10. Fragment according to claim 9, characterized in that the biological sample is a biological fluid chosen from serum, plasma, synovial fluid and urine.

11. Fragment according to claim 9, characterized in that the autoimmune disease is multiple sclerosis.

12. Endogenous transcription product which is in isolated form and which can be obtained by transcription of at least said portion of the *gag* gene of a fragment according to any one of claims 1 to 11.

13. Method for detecting endogenous nucleotide sequences belonging to a fragment as defined according to one of claims 1 to 11, characterized in that:

a prior step of extraction of the cellular DNA from a tissue or biological fluid is carried out, and then at least one cycle of amplification of the cellular DNA is carried out, for instance by PCR, using primers in particular chosen from SEQ ID NO. 4 to SEQ ID NO. 9 and SEQ ID NO. 12 to SEQ ID NO. 17,

the cellular DNA present in the sample is brought into contact with a given probe which is capable

of hybridizing with a fragment as defined above and of forming a hybridization complex, said probe comprising at least 15 contiguous nucleotides, preferably 17 and advantageously 19 contiguous nucleotides, of SEQ ID NO. 3, or consisting of SEQ ID NO. 3, under suitable conditions for the hybridization, in particular under conditions of high stringency, and

the hybridization complexes formed are detected by any suitable means.

14. Method according to claim 13, characterized in that the probe is labeled with a tracer, such as for example a radioactive tracer or an enzyme.

15. Method for detecting endogenous nucleotide sequences belonging to a fragment as defined according to one of claims 1 to 11, characterized in that:

a prior step of extraction of the cellular DNA from a tissue or biological fluid, optionally derived from isolated chromosomes, is carried out, and then at least one cycle of amplification of the cellular DNA is carried out, for instance by PCR, using primers in particular chosen from SEQ ID NO. 4 to SEQ ID NO. 9 and SEQ ID NO. 12 to SEQ ID NO. 17,

a step of in vitro transcription/translation of the amplified product is carried out, and

the product derived from the transcription/translation step is reacted with a serum or plasma from a patient with an autoimmune disease.

16. Method for studying and/or monitoring T-cell proliferation in vitro, according to which the T cells from a patient are brought into contact with either transcription/translation products (SEQ ID NO. 31), as obtained according to the method of claim 15, or synthetic peptides derived from or belonging to SEQ ID NO. 31.

17. Method for the in situ molecular labeling of chromosomes isolated from patients, in which a probe labeled with any suitable tracer, and comprising all or part of SEQ ID NO. 3, is used.

18. Recombinant protein obtained using an expression cassette in a bacterial host, characterized in that its protein sequence consists of SEQ ID NO. 31.

19. Protein according to claim 18, characterized in that the bacterial host is *E. coli*.

20. Reagent for detecting an autoimmune disease or monitoring pregnancy, comprising at least one fragment according to any one of claims 1 to 11 or one protein according to claims 16, 18 and 19.

21. Use of a fragment according to any one of claims 1 to 11 or of a protein according to claims 16, 18 and 19, for detecting, in a biological sample, susceptibility to an autoimmune disease, or monitoring pregnancy.

22. Use according to claim 21, characterized in that the autoimmune disease is multiple sclerosis.

CLAIMS

1. Nucleic acid fragment, characterized in that it consists of at least one portion of the *gag* gene of an endogenous retrovirus associated with an autoimmune disease, or with unsuccessful pregnancy or pathological conditions of pregnancy, said portion being chosen from SEQ ID NO. 2 and any series of contiguous nucleotides belonging to SEQ ID NO. 2 but not belonging to SEQ ID NO. 1 and encoding an expression product, or the sequence complementary to said fragment.

2. Fragment according to claim 1, characterized in that it can be isolated from at least one of human chromosomes 1, 3, 6, 7 and 16.

3. Fragment according to claim 2, characterized in that it can be isolated from at least chromosome 3.

4. Fragment according to claim 1, characterized in that the expression product is messenger RNA.

5. Fragment according to claim 1, characterized in that the expression product is immunologically recognized by antibodies present in a biological sample from a patient suffering from an autoimmune disease.

6. Fragment according to claim 5, characterized in that the autoimmune disease is multiple sclerosis.

7. Transcription product which can be obtained by transcription of at least said portion of the *gag* gene of a fragment according to any one of claims 1 to 6.

8. Method for detecting, in a biological sample, nucleotide sequences which are integrated into the DNA of the human genome and which belong to the gag gene of an endogenous retrovirus associated with an autoimmune disease, or with unsuccessful pregnancy or pathological conditions of pregnancy, characterized in that:

- a prior step of extraction of the cellular DNA of said biological sample is carried out, and then at least one cycle of amplification of the cellular DNA is carried out, for instance by PCR, using primers in particular chosen from SEQ ID NO. 4 to SEQ ID NO. 9 and SEQ ID NO. 12 to SEQ ID NO. 17,

- the cellular DNA present in the sample is brought into contact with a given probe which is capable of hybridizing with a said nucleotide sequence and of forming a hybridization complex, said probe comprising at least 15 contiguous nucleotides, preferably 17 and advantageously 19 contiguous nucleotides, of SEQ ID NO. 3, or consisting of SEQ ID NO. 3, under suitable conditions for the hybridization, in particular under conditions of high stringency, and

- the hybridization complexes formed are detected by any suitable means.

9. Method according to claim 8, characterized in that the probe is labeled with a tracer, such as for example a radioactive tracer or an enzyme.

10. Method for detecting, in a biological sample, nucleotide sequences which are integrated into the

DNA of the human genome and which belong to the gag gene of an endogenous retrovirus associated with an autoimmune disease, or with unsuccessful pregnancy or pathological conditions of pregnancy, characterized in that:

- a prior step of extraction of the cellular DNA of said biological sample, optionally derived from isolated chromosomes, is carried out, and then at least one cycle of amplification of the cellular DNA is carried out, for instance by PCR, using primers in particular chosen from SEQ ID NO. 4 to SEQ ID NO. 9 and SEQ ID NO. 12 to SEQ ID NO. 17,

- a step of in vitro transcription/translation of the amplified product is carried out, and

- the product derived from the transcription/translation step is reacted with a serum or plasma from a patient with an autoimmune disease.

11. Method according to any one of ~~claims~~ 8 to 10, characterized in that ~~the~~ biological sample is a biological ~~fluid~~ chosen from serum, plasma, ~~synovial~~ fluid and urine.

12. Method for studying and/or ~~monitoring~~ T-cell proliferation in vitro, according to which the T cells from a patient ~~are~~ brought into contact with either ~~transcription~~/translation products, as obtained ~~according~~ to the method of claim 11, or ~~synthetic~~ peptides belonging to SEQ ID NO. 31.

13. Method for the in situ molecular labeling of chromosomes isolated from patients, in which a

probe labeled with any suitable tracer, and comprising all or part of SEQ ID NO. 3, is used.

14. Recombinant protein obtained using an expression cassette in a bacterial host, characterized in that its protein sequence consists of SEQ ID NO. 31.

15. Protein according to claim 14, characterized in that the bacterial host is *E. coli*.

16. Reagent for detecting, in a biological sample, an autoimmune disease or monitoring pregnancy, comprising at least one fragment according to any one of claims 1 to 6, one transcription/translation product, as obtained according to the method of claim 11, one synthetic peptide belonging to SEQ ID NO. 31 or one protein according to claim 15 or 16.

17. Use of a fragment according to any one of claims 1 to 6, of a transcription/translation product, as obtained according to the method of claim 11, of a synthetic peptide belonging to SEQ ID NO. 31 or of a protein according to claim 15 or 16, for detecting, in a biological sample, susceptibility to an autoimmune disease, or monitoring pregnancy.

18. Use according to claim 17, characterized in that the autoimmune disease is multiple sclerosis.

FIG 1